FADINI Elpro 42 Control Programmer 4200L Instruction Manual

Contents

FADINI Elpro 42 Control Programmer 4200L

GENERAL WARNINGS FOR PEOPLE SAFETY

THANK YOU

- Thank you for purchasing a Fadini product.
- Please read these instructions carefully before using this appliance.
- The instructions contain important information that will help you get the best out of the appliance and ensure safe and proper installation, use and maintenance.
- Keep this manual in a convenient place so that you can always refer to it for the safe and proper use of the appliance.

INTRODUCTION

- This operator is designed for a specific scope of applications as indicated in this manual, including safety, control and signalling accessories as the minimum required with Fadini equipment.
- Any applications not explicitly included in this manual may cause operation problems or damage to properties and people.
- Meccanica Fadini S.r.l. is not liable for damages caused by the incorrect use of the equipment, or for applications not included in this manual or for malfunctioning resulting from the use of materials or accessories not recommended by the manufacturer.
- The manufacturer reserves the right to make changes to its products without prior notice.
- All that is not explicitly indicated in this manual is to be considered not allowed.

BEFORE INSTALLATION

- Before commencing operator installation assess the suitability of the access, its general condition and the

structure.

- Make sure that there is no risk of impact, crushing, shearing, conveying, cutting, entangling and lifting situations, which may prejudice people's safety.
- Do not install near any source of heat and avoid contact with flammable substances.
- Keep all the accessories able to turn on the operator (transmitters, proximity readers, key switches, etc) out of the reach of the children.
- Transit through the access only with the stationary operator.
- Do not allow children and/or people to stand in the proximity of a working operator.
- To ensure safety in the whole movement area of a gate it is advisable to install photocells, sensitive edges, magnetic loops and detectors.
- Use yellow-black strips or proper signals to identify dangerous spots.
- Before cleaning and maintenance operations, disconnect the appliance from the mains by switching off the master switch.
- If removing the actuator, do not cut the electric wires, but disconnect them from the terminal box by loosening the screws inside the junction box.

INSTALLATION

- All installation operations must be performed by a qualified technician, in observance of the Machinery Directive 2006/42/CE and safety regulations EN 12453 – EN 12445.
- Verify the presence of a thermal-magnetic circuit breaker 0,03 A – 230 V – 50 Hz upstream the installation.
- Use appropriate objects to test the correct functionality of the safety accessories, such as photocells, sensitive edges, etc.
- Carry out a risk analysis through appropriate instruments measuring the crushing and impact force of the main opening and closing edge in compliance with EN 12445.
- Identify the appropriate solution necessary to eliminate and reduce such risks.
- In case where the gate to automate is equipped with a pedestrian entrance, it is appropriate to prepare the system in such a way to prohibit the operation of the engine when the pedestrian entrance is used.
- Apply safety nameplates with CE marking on the gate warning about the presence of an automated installation.
- The installer must inform and instruct the end user about the proper use of the system by releasing him a technical dossier, including layout and components of the installation, risk analysis, verification of safety accessories, verification of impact forces and reporting of residual risks.

INFORMATION FOR END-USERS

- The end-user is required to read carefully and to receive information concerning only the operation of the installation so that he becomes responsible for the correct use of it.
- The end-user shall establish a written maintenance contract with the installer/maintenance technician (on-call).
- Any maintenance operation must be done by qualified technicians.
- Keep these instructions carefully.

WARNINGS FOR THE CORRECT OPERATION OF THE INSTALLATION

- For optimum performance of the system over time according to safety regulations, it is necessary to perform

proper maintenance and monitoring of the entire installation: the automation, the electronic equipment and the cables connected to these.

- The entire installation must be carried out by qualified technical personnel, filling in the Maintenance Manual indicated in the Safety Regulation Book (to be requested or downloaded from the site **www.fadini.net/supporto/downloads**).
- Operator: maintenance inspection at least every 6 months, while for the electronic equipment and safety systems an inspection at least once every month is required.
- The manufacturer, Meccanica Fadini S.r.l., is not responsible for the non-observance of good installation practices and incorrect maintenance of the installation.

DISPOSAL OF MATERIALS

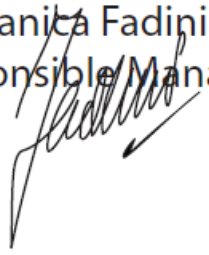
Dispose properly of the packaging materials such as cardboard, nylon, polystyrene etc. through specializing companies (after verification of the regulations in force at the place of installation in the field of waste disposal). Disposal of electrical and electronic materials: to be removed and disposed of through specializing companies, as per Directive 2012/19/UE. Disposal of substances hazardous for the environment is prohibited.

UE DECLARATION OF CONFORMITY (DoC)

- Manufacturer: Meccanica Fadini S.r.l.
- Address: Via Mantova, 177/A – 37053 Cerea – VR – Italy declare that the DoC is issued under our sole responsibility and belongs to the following product:
- Control unit model ELPRO 42 is in conformity with the relevant Union harmonisation legislation:
- Electromagnetic Compatibility Directive 2014/30/UE
- Low Voltage Directive 2014/35/UE

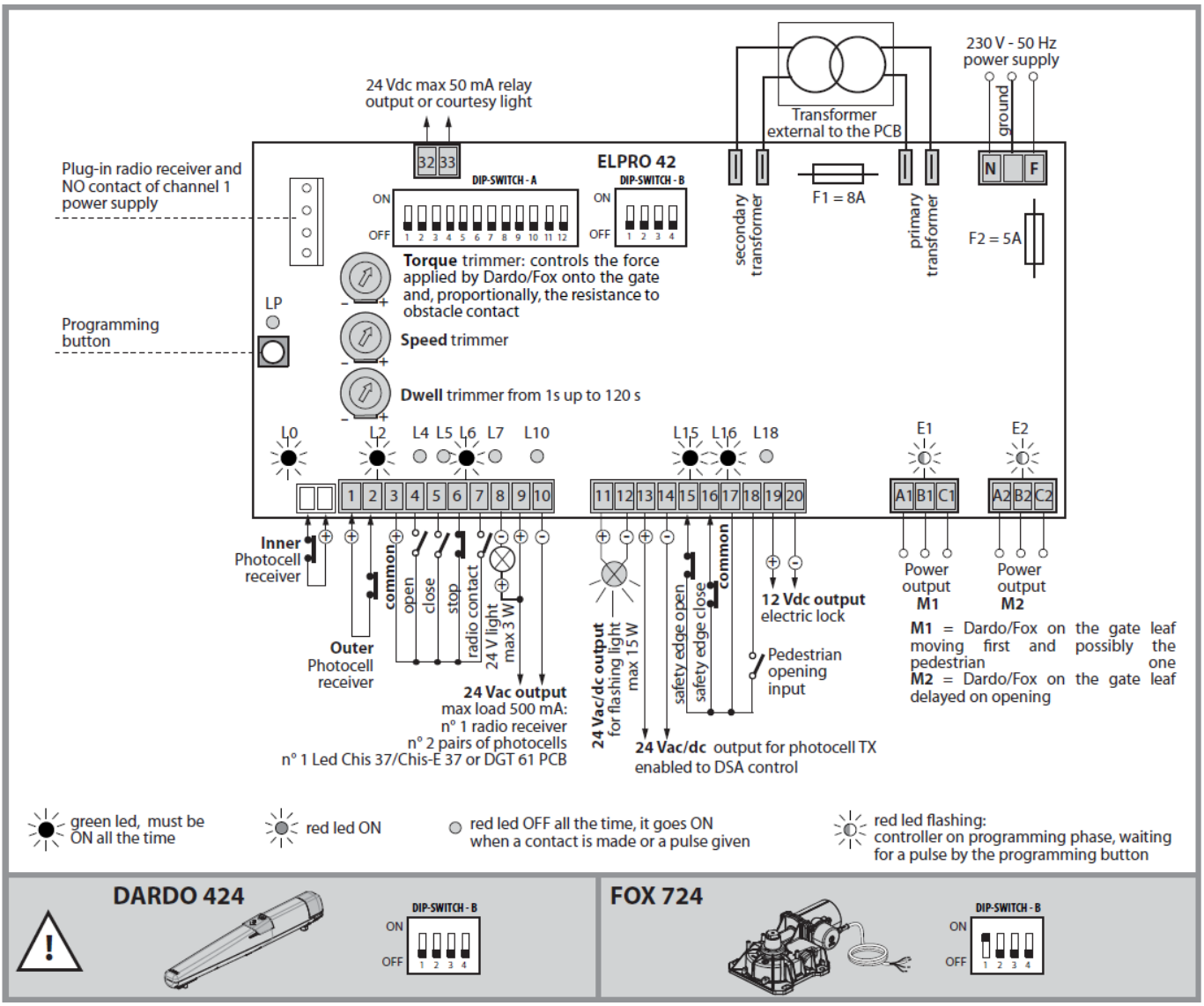
Cerea, 19/04/2017

Meccanica Fadini S.r.l.
Responsible Manager



WIRING

ELECTRONIC CONTROLLER FOR DARDO 424 AND FOX 724 GATE OPERATOR ON DOUBLE SWINGING GATES



General Description

General description: the electronic controller ELPRO 42 has been designed to control the gate operator type DARDO 424 and FOX 724 at 24 V, mounted on single- or double-swinging gates. 230 V – 50 Hz single-phase power supplied. The manufacturer is not liable for incorrect use of the controller, and reserves also the right to change and update it to the latest standards of the art at any time.

IMPORTANT FOR THE INSTALLATION AND PROPER FUNCTIONING

- The controller is to be installed in a sheltered, dry place.
- Make sure that the power supply to the electronic controller be 230 V ±10%.
- In case of distances superior to 50 meters, increase the wire section.
- Fit the power supply to the controller with a 0,03 A, high-sensibility, magneto-thermal circuit breaker.
- For the power supply, electric motor and flasher use1,5 mm² section wires up to 50 m of distance.
- For the limit switches, photocells, command switches and accessories use 1 mm² section wires.
- If no stop button is used bridge terminals 3 and 6.
- N.W.: for applications such as light control, CCTV, etc. use solid-state relays to prevent interference with the microprocessor.

DIAGNOSTICS BY LEDs:

- L0 (Green ON) = Pair of photocells fitted inside, no obstacle detected
- L2 (Green ON) = Pair of photocells closing, no obstacle detected
- L4 (Red OFF) = Open, switches ON when a command pulse to open is given
- L5 (Red OFF) = Close, switches ON when a command pulse to close is given
- L6 (Green ON) = Stop, switches OFF when a command pulse to stop is given
- L7 (Red OFF) = Radio, switches ON when a transmitter button is pulsed and the radio contact is made on terminals 3 and 7
- L10 (Red OFF) = Switches ON in case of a short circuit with the 24 Vdc.
- It switches OFF when the short circuit fault is removed
- L15 (Green ON) = Safety edge open, switches OFF whenever the safety edge is engaged
- L16 (Green ON) = Safety edge close, switches OFF whenever the safety edge is engaged
- L18 (Red OFF) = Switches ON whenever a pedestrian command is given
- E1 (Red ON) = Encoder led
- E2 (Red ON) = Encoder led

TROUBLESHOOTING IN CASE OF FAILURE

- Make sure that the power supply to the controller be 230 V ±10%
- Check all the fuses
- Check the photocells contact, it must be normally closed
- Make sure that no voltage drop occurs between the control board and the electric motor
- Check all the NC contacts in the control board

NOTE WELL
All the possible connections to the control board terminals are also illustrated in the respective instructions provided with the individual accessories.

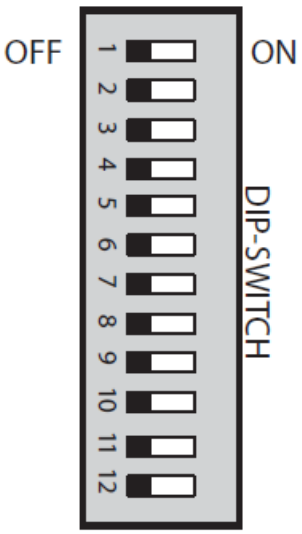
SELECT THROUGH DIP-SWITCH N.1 WHETHER TO USE DARDO 424 OR FOX 724. All possible connections to the programmer terminals are also illustrated in the instruction sheets of the individual accessories.

NOTE WELL: THE INSTALLATION OF NON-FADINI ORIGINAL ACCESSORIES MAY DAMAGE THE PC BOARD. MAKE SURE THAT FREE CONTACTS BE ALWAYS USED FOR THE NO-NC INPUTS. BRIDGE ALL THE NC CONTACTS NOT IN USE.

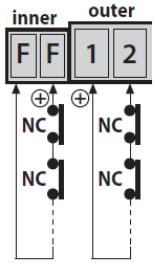
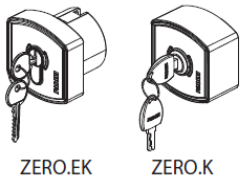
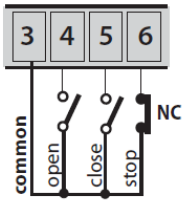
Dip-Switches

1. OFF Photocell. No stop in the opening
2. OFF Radio contact 3-7 stop and reverse in opening
3. OFF Semiautomatic functioning
4. OFF No pre-flashing before opening
5. OFF Radio contact 3-7 reverse on each pulsing
6. OFF
7. OFF No stroke reversing pulse in the opening.
8. OFF Flasher (contact 11-12) ON in dwell time.
9. OFF No reclosing after crossing the photocells
10. OFF No photocell DSA control before any operation

11. OFF
12. OFF



1. ON Photocell. Stop in opening
2. ON Radio contact 3-7 no stop and no reverse in opening
3. ON Automatic closing after dwell time
4. ON Fixed pre-flasing before gate moving
5. ON Radio contact 3-7 step by step: open-stop-close-stop
6. ON Enable braking speed adjustment
7. ON Stroke reversing pulse for 2 s is enabled in opening
8. ON Flasher (contact 11-12) OFF in dwell time.
9. ON Reclosing after crossing the photocells (Dip 3= ON)
10. ON Photocell DSA control before any operation
11. ON Delete slowdown during opening
12. ON Delete slowdown during closing

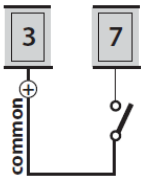
Accessory	*Electrical connections*	*Dip-switch and LED indication of the various functions*
Photocells:  ZERO.PH Trifo 11 Orbita 57	 View from inside property: **Outer photocells:** all the **NC contacts** of the receivers of the outer photocells are to be **series** connected to terminals **1** and **2**: on being engaged, in closing phase, gate travel is revered to open. **Inner photocells:** all the **NC contacts** of the receivers of the inner photocells are to be **series** connected: on being engaged, gate travel is stopped in opening, closing and dwell time untill cleared.	**DIP-SWITCH N° 1:** **ON**: stop in opening and reverse in closing once obstacle is removed 1 **OFF**: no stop in opening and reverse in closing when obstructed **L2 green ON** = no obstacle detected, goes OFF when an obstacle is detected
Keyswitch:  ZERO.EK ZERO.K	 NO and NC contacts to be connected to the respective terminals of the key- or button-operated switches. All possible configurations are in the instructions attached to the specific command accessory.	**L4 red OFF** = no OPEN contact, it goes ON whenever an open pulse is given **L5 red OFF** = no CLOSE contact, it goes ON whenever a close pulse is given **L6 green ON** = STOP contact closed, it goes OFF whenever a stop pulse is given

Radio contact:

Receivers:
Astro 43,
Jubi 433,
Siti 63, Birio 868, VIX 53

Main PCB
ZERO.DGT

Receiver
ZERO.SAPE



By any NO connection to these two terminals the following is performed, on each pulsing:

- Opening only:
Dip 2=ON and Dip 5=OFF

- Travel reversing on each pulsing
Dip 2=OFF and Dip 5=OFF

- Step by step operations:
open-stop-close-stop
Dip 2=OFF and Dip 5=ON

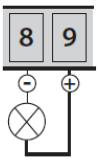
DIP-SWITCHES N° 2 AND 5 (do NOT set both of them to ON at the same time):

2 **ON**: no stop and no reverse in opening
OFF: stop and reverse in opening on pulsing

5 **ON**: step by step with stop in between
OFF: gate travel reverse on radio pulsing

○ **L7 red OFF** = no RADIO contact,
it goes ON whenever a radio pulse is given

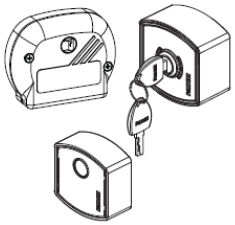
24 V - max 3 W pilot light output:

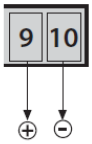


Output provided in case a light be required to indicate gate status:
Light **ON** = gate open
Light **OFF** = gate closed
Flashing **0,5 s (fast)** = gate closing
Flashing **1 s (normal)** = gate opening

Accessory	*Electrical connections*	*Dip-switches and LED indication of the various functions*

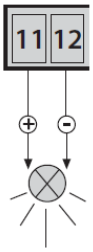
24 V - max 500 mA output:





24 Vac output
max. load 500 mA:
n° 1 radio receiver
n° 2 pairs of photocells
n° 1 led Chis 37/Chis-E 37 or DGT 61 PCB

24 Vdc flasher:



24 Vdc output for the flasher

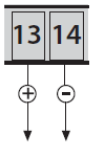
DIP-SWITCHES N° 4 and 8:

4 **ON:** pre-flashing before opening
OFF: no pre-flashing

8 **ON:** flasher disabled in dwell time on automatic mode of operation (**Dip 3 = ON**)
OFF: it flashes in dwell time on automatic mode of operation (**Dip 3 = ON**)

24 Vac/dc output for DSA control

Photocells projectors

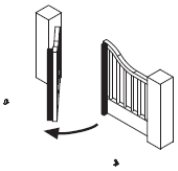


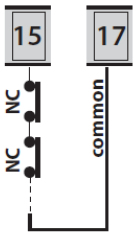
24 V output to power supply the projectors of the photocells (power supplied in parallel) on **DSA** control: **D**evice for **S**afety **A**utotest = before gate operation, provided that this function is enabled. All of the safety devices are tested and assessed to be free from any obstraction, otherwise the operator is not allowed to start.

DIP-SWITCH N° 10:

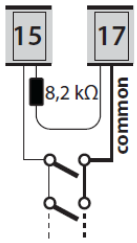
10 **ON:** DSA control enabled on photocells.
It is necessarily required that the photocells projectors be power supplied to 13-14 terminals
OFF: no DSA control on the photocells

Input for safety edge in opening





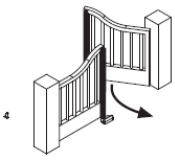
In series if NC mechanical type

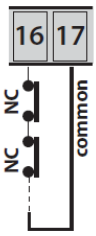


In parallel if 8,2 kΩ resistive type

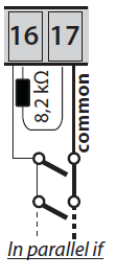
L15 green ON = safety edge in opening. It goes OFF whenever the safety edge is activated

Input for safety edge in closing





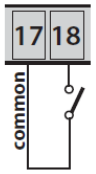
In series if NC mechanical type



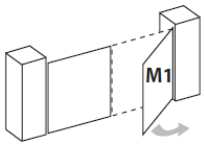
In parallel if 8,2 kΩ resistive type

L16 green ON = safety edge in closing. It goes OFF whenever the safety edge is activated

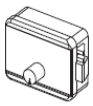
Input for pedestrian opening (M1 motor only)

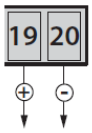


Input for pedestrian opening



Electric lock output 12 Vdc



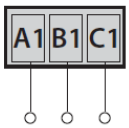
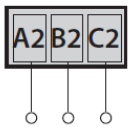


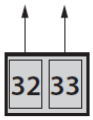
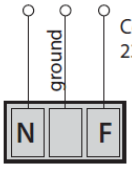
12 Vdc output for the electric lock

DIP-SWITCH N° 7:

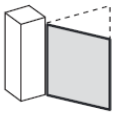
7 **ON:** stroke reversing pulse enabled for 2 s in opening
OFF: stroke reversing pulse disabled

For a proper latching of the electric lock, adjust slowdown speed accordingly .

Accessory	*Electrical connections*	*Dip-switcheses and LED indication of the various functions*
Motor power supply	 Power supply output **M1**  Power supply output **M2** **M1** = Dardo/Fox on the 1st gate leaf to open and being also the pedestrian one, if required **M2** = Dardo/Fox on the gate leaf delayed on opening.	 **Speed** trimmer: to adjust the maximum gate speed. Gate will adjust to the new setting after any open/close/radio pulse  **Force** trimmer: to adjust the force exerted by Dardo/Fox on the gate and in proportion the resistance on contact with an obstacle  **Dwell** trimmer: from 1 s to 120 s
Engine slowdown	During programming, the slowdown start point is automatically defined. It is possible to eliminate the opening and closing slowdown using dip-switches 11 and 12.	**DIP-SWITCH-A N° 11 and 12:** 11 **ON:** delete slowdown during opening 11 **ON:** delete slowdown during closing

24 Vdc max 50 mA relay output or courtesy light	 Output voltage during operation and for a further 2 minutes at the end of the operating cycle	
PC Board power supply	 Control board power supply 230 V - 50 Hz	

INSTALLATION ON A SINGLE GATE

Motor power supply 	 **M1** = this output is to be used for Dardo/Fox on a single mount	 Bridge B1 with B2 and carry on programming **excluding delay mode on gate leafs**.

NOTE WELL: any new setting on the dip-switches controlling gate functions is performed following an open or close pulse.
FORCE SETTING:

- The force is to be adjusted by the dedicated trimmer to a setting sufficient to move the gate.
- Before programming is started, it is recommended that the dedicated trimmer be set in proportion to gate weight and size.
- Such setting controls also the force developed on the slowdow phase and resistance on impact with an obstacle.
- An excessive amount of force against gate inertia implies that the installation may not be in full conformity with the EN 12445 and EN 12453 safety norms. Therefore, once the force to be exerted on the automated gate has been set, the installer is required to assess the forces involved according to the provisions of the EN 12445 and EN 12453 norms documented in the “Safety Norms” manual made available by the company on www.fadini.net.

FUNCTIONS OF ELPRO 42 CONTROL UNIT

AUTOMATIC / SEMIAUTOMATIC

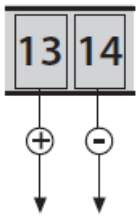
- Automatic cycle: on pulsing an open command, the gate opens, stays open untill dwell time expires as set by the dwell trimmer, then closes automatically.
- On transiting through the outer pair of photocells, dwell time is reactivated.
- Semiautomatic cycle: on pulsing an open command, the gate opens and stops in the open position. A close pulse is needed for the gate to close.

GATE TRAVEL REVERSE ON CONTACT WITH AN OBSTACLE

- A function allowing for the travel direction to be reversed on contact with an obstacle.
- Sensitivity of the function is proportional to the force exerted by Dardo/Fox as set by the Force Trimmer.
- Opening phase: The travel direction is reversed allowing for the gate to be cleared of the obstacle.
- Gate is held and stopped waiting for a new command.
- Closing phase: The travel direction is reversed back to the gate stop in the open position.
- N.W. In case an obstacle is detected for 5 consecutive times during a complete cycle, open-dwell-close, the gate stays open waiting for a command.

RECLOSING ON ENGAGING THE PHOTOCELLS:
in opening and dwell phases (DIP N° 3 = ON).
This function allows the gate auto close after 3 s from crossing the photocells beam.

DSA: AUTOMATIC ASSESSMENT OF THE PHOTOCELLS STATUS
For DAS (Device for Safety Autotest) control to be enabled, connect only the projectors of the photocells to these terminals and set Dip N° 10 = ON.
Before any gate operation, provided that this function is enabled, Elpro 42 performs a test on all the photocells connected to it to make sure they are free from obstacles and properly working, otherwise, the gate is not allowed to start moving.



OPENING BY EXTERNAL TIME CLOCK
Connections: parallel connect the NO contact of the time clock to terminals 4 open and 3 commons, and set the system to auto close by dip-switch n° 3 = ON.
How it works: set the clock to the required opening and closing times. On the pre-set time the gate is opened and held open (the flasher goes off), and no more commands (even by radio) are accepted until the closing time pre-set on the clock expires. On expiring, and after the pre-set dwell time, automatic close is performed.

Dip-switches and LED indication of the various functions

DIP-SWITCH N° 3:

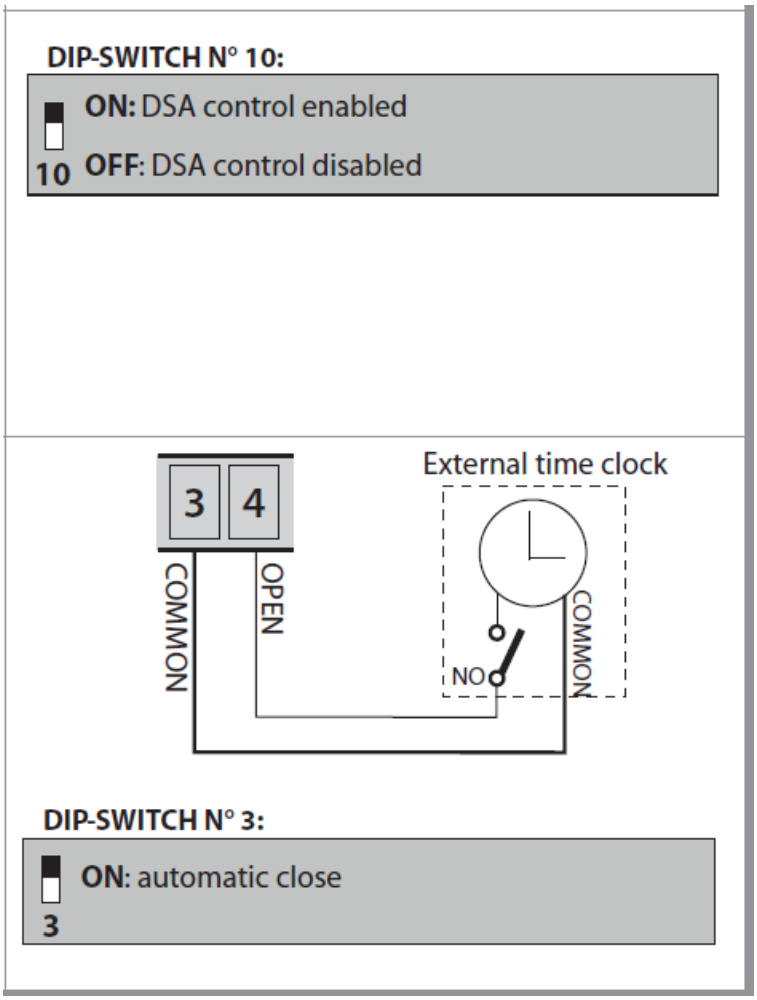
3	**ON**: automatic close **OFF**: semiautomatic

Dwell trimmer: dwell time can be set from 1 s to 120 s, automatic mode to be selected.

Force trimmer: to adjust the force exerted by Dardo/Fox on the gate and in proportion the resistance on contact with an obstacle

DIP-SWITCH N° 9:

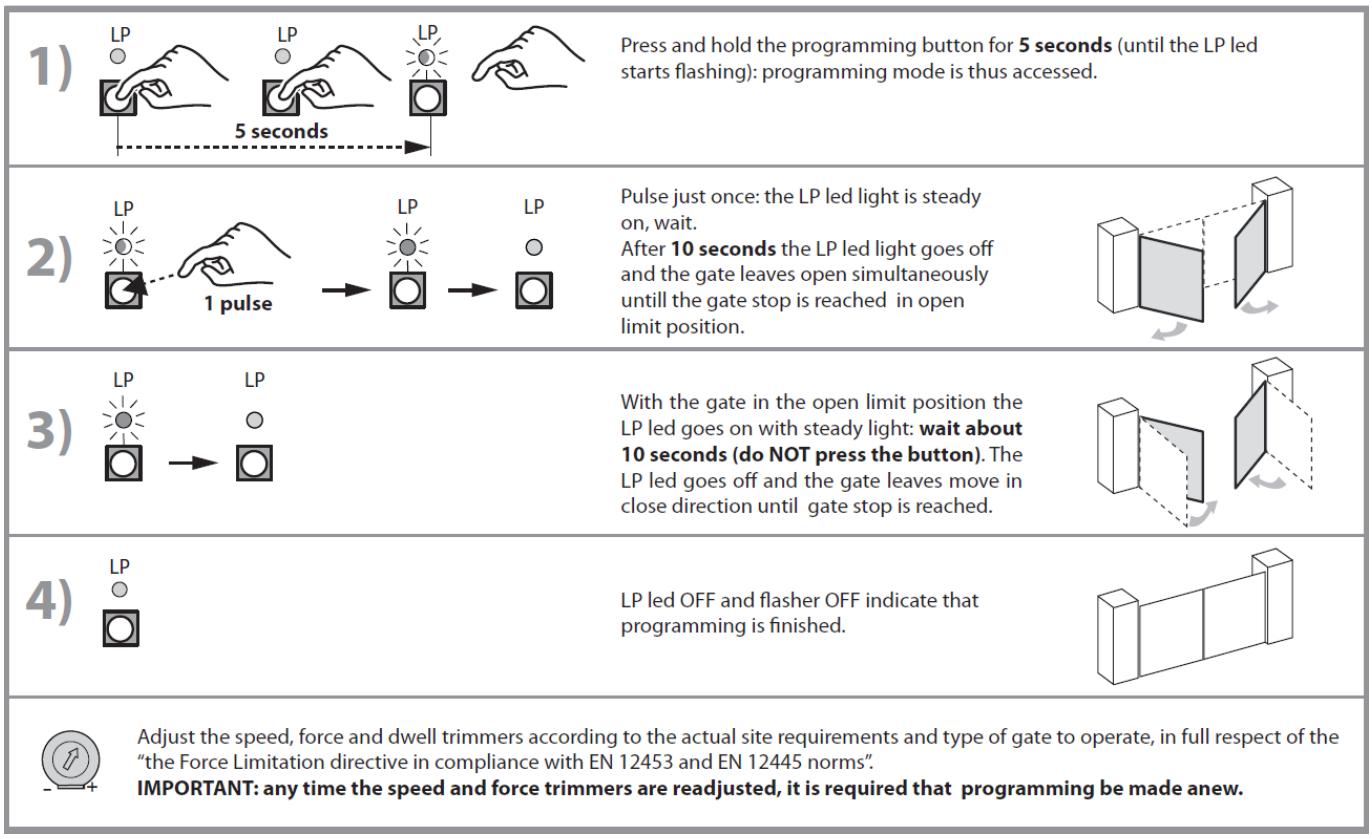
9	**ON:** gate auto close after **3 s** from crossing the photocells pair **OFF**: no auto close after crossing the photocells



EXCLUDING GATE LEAF DELAY ON PROGRAMMING
(when it is required that both gate leafs be opened simultaneously and for single gate applications where one motor only is involved).
Once all the electrical connections to the control unit have been properly made (following the instructions included in the box) with all of the safety and command accessories as required, programming can be carried out.

NOTE VERY WELL: all of the green LEDs must be ON, otherwise check the connections with any accessory, mainly the NC contacts of the safety devices installed (contacts of the inner and outer photocells, stop contact, safety edges, …).

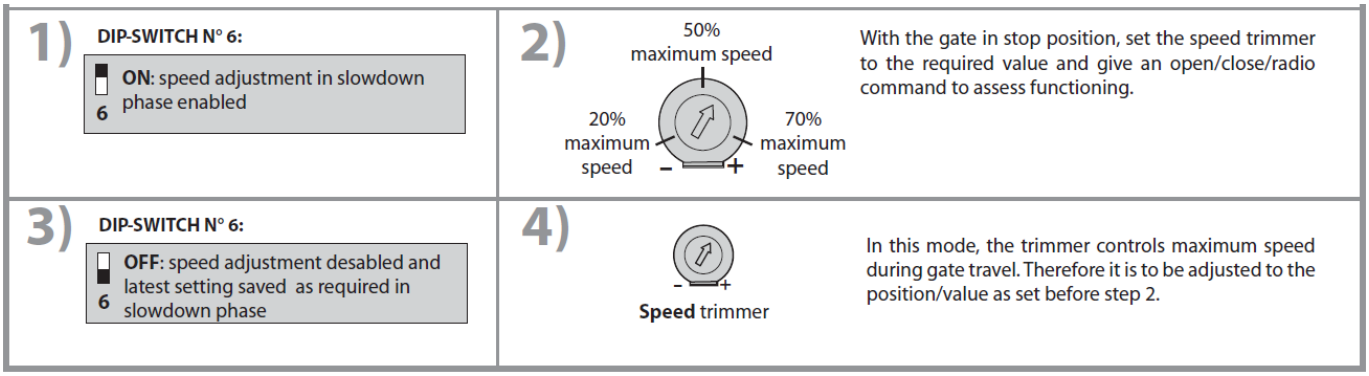
PROGRAMMING THE UNIT TO OPERATE ON NO GATE LEAF DELAY MODE



ADJUSTING SPEED IN SLOWDOWN PHASE

- Default speed at the end of the slowdown phase is 25% of the maximum speed.
- It is possible to adjust the final speed of the slowdown phase as described in the steps below. Depending on the application requirements, an even softer stop of the gate at the end of the permitted stroke can be achieved or, on the contrary, a more vigorous one to facilitate latching in case an electric lock is fitted.

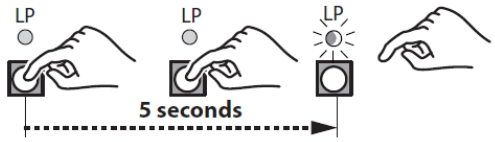
NOTE WELL: speed readjustments will be executed following any open/close/radio pulse. Readjust speed and then give an open/close/radio command to assess functioning.



PROGRAMMING THE UNIT TO OPERATE IN GATE LEAF DELAY MODE (when one gate leaf overlaps the other in a closed position) Programming in this way is required when gate leafs overlap each other, therefore they are to be started later on opening and closing alternatively.
Once all the electrical connections to the control unit have been properly made (following the instructions included in the box) with all of the safety and command accessories as required, programming can be carried out.

NOTE VERY WELL: all of the green LEDs must be ON, otherwise check the connections with any accessory, mainly the NC contacts of the safety devices installed (contacts of the inner and outer photocells, stop contact, safety edges, …).

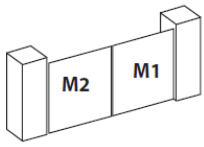
PROGRAMMING THE UNIT TO OPERATE ON GATE LEAF DELAY MODE

1) 

Press and hold the programming button for **5 seconds** (until the LP led starts flashing): programming mode is thus accessed.

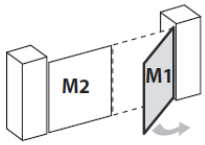
2) 

Pulse just once: the LP led light is steady on



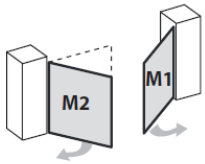
3) 

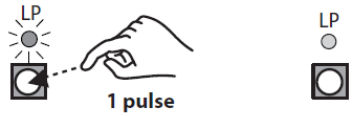
Within 10 seconds from the previous pulse, give a second pulse (programming mode gate leaf delay is entered): the led light goes off and the 1st gate leaf (pedestrian) starts opening operated by Dardo/Fox connected to M1 block of terminals.
Gate delay opening time corresponds to the time elapsing before next step is carried out .



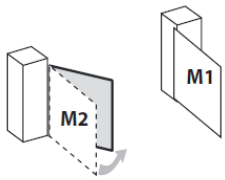
4) 

Pulse once: the second gate leaf, the delayed one, starts opening (Dardo/Fox connected to M2 terminals).
Gate delay opening time corresponds to the time elapsed from the previous pulse.



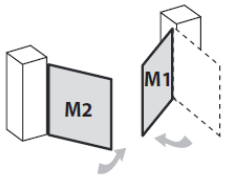
5) 

On both gate leaves reaching gate stops in open limit positions, **LP led light is steady on.**
Pulse once: Dardo/Fox M2 gate leaf starts closing.
Gate delay closing time corresponds to the time elapsing before next step is carried out.



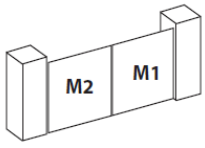
6) 

Pulse once: Dardo/Fox M1 gate leaf starts closing.
Gate delay closing time corresponds to the time elapsed from the previous pulse.



7) 

On both gate leaves reaching gate stops in close limit positions, LP led goes off. Programming finished.



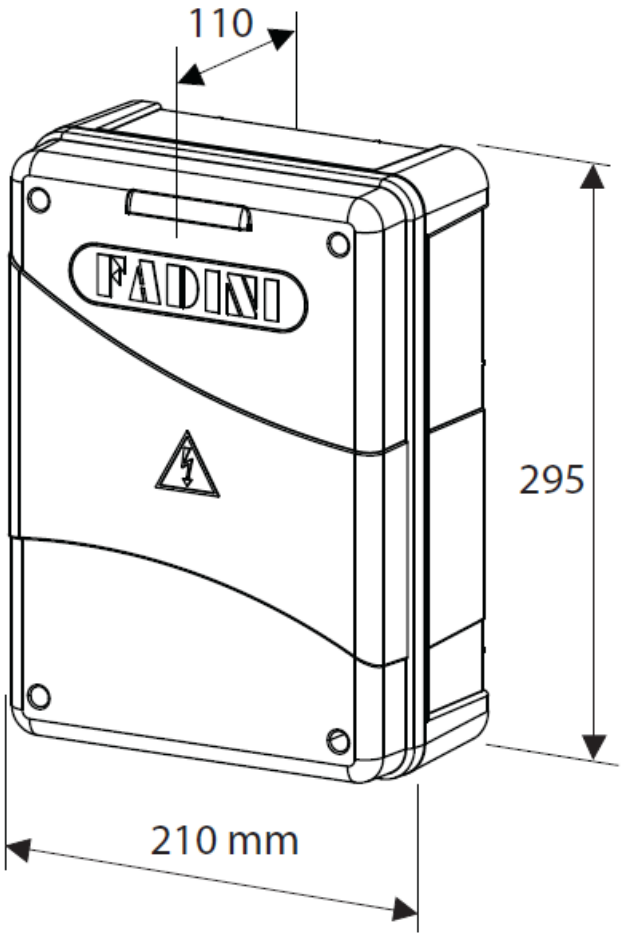
Adjust the speed, force and dwell trimmers according to the actual site requirements and type of gate to operate, in full respect of the "the Force Limitation directive in compliance with EN 12453 and EN 12445 norms".
IMPORTANT: any time the speed and force trimmers are readjusted, it is required that programming be made anew.

TECHNICAL SPECIFICATIONS

- **Single-phase PCB power supply:** 230 Vac ±10% 50 Hz
- **Three-phase PCB power supply:** –
- **Max. power of motors:** 200 W
- **Courtesy light output:** 24 Vdc – 50 mA
- **Photocells/keyswitch/radio receiver output:** 24 Vdc – 500 mA
- **Pilot light output:** 24 Vdc – 3 W
- **DSA control output:** 24 Vdc – 150 mA

- **Flasher output:** 24 Vdc – 15 W
- **Motor run time:** –
- **Dwell time:** 1 – 120 s
- **Closing gate delay time:** –
- **Pedestrian opening time:** –
- **Box dimensions:** 210x295x110 mm
- **Protection standards:** IP 64
- **Working temperature:** -20 °C +55 °C
- **Power supply by battery:** 12 V

Dimension



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Documents / Resources

	**FADINI Elpro 42 Control Programmer 4200L** [pdf] Instruction Manual Elpro 42 Control Programmer 4200L, Elpro 42, Control Programmer 4200L, Programmer 4200L

References

- **User Manual**